

Kilowatt Level Uplinks for Deep Space Optical Communications, Phase I

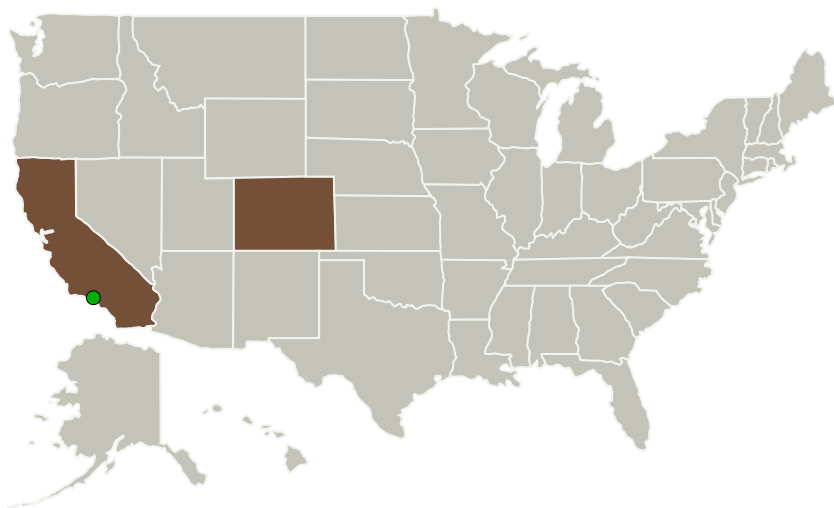
Completed Technology Project (2017 - 2017)



Project Introduction

In a prior program, Optical Engines was able to achieve 300 W average CW power in a Packaged Deep Space uplink transmitter delivered to JPL. In order to meet the stated JPL goal of 500W of average power with a 20% duty factor in a low data rate configuration, over 3kW of pump power will be required. In order to operate with the nested high data rate option, mj level pulse energies at high average powers will need to be achieved. These performance requirements call for novel and unique designs in order to navigate a potential system around fiber non linearities and thermal modal instabilities. Optical Engines proposes to develop a 1030nm counter pumped composite microstructured fiber based transmitter system. To accomplish this a counter pumped fiber combiner and a specific double mode adapter will be developed and demonstrated, with the 500W average power 2500 W peak power low data rate configuration being developed and demonstrated along with designs for the nested high data rate configuration being completed.

Primary U.S. Work Locations and Key Partners



Kilowatt Level Uplinks for Deep Space Optical Communications, Phase I Briefing Chart Image

Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
Optical Engines, Inc.	Lead Organization	Industry	Colorado Springs, Colorado
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Colorado

Project Transitions

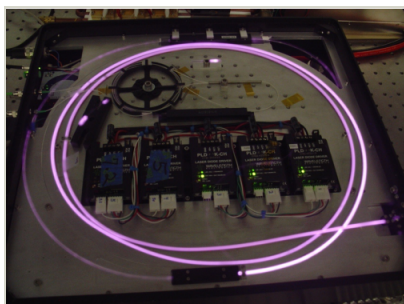
▶ **June 2017:** Project Start

✓ **December 2017:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140759>)

Images



Briefing Chart Image

Kilowatt Level Uplinks for Deep Space Optical Communications, Phase I Briefing Chart Image (<https://techport.nasa.gov/image/132179>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Optical Engines, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

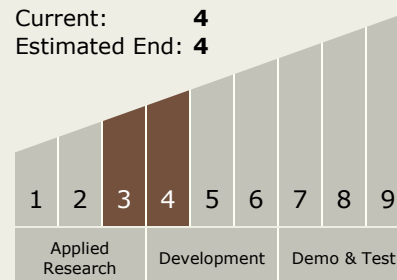
Carlos Torrez

Principal Investigator:

Donald L Sipes

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
 - └ TX05.1 Optical Communications
 - └ TX05.1.3 Lasers

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System